

CLAIMS

1. A method of identifying a predetermined number of computers within a computer network which satisfy one or more specified conditions, the method comprising the steps of:
 - a first computer communicating to one or more of the computers in the network a request message which includes said one or more specified conditions and a token value which is indicative of a number of computer devices to be located by the message;
- 10 each subsequent computer which receives a request message processing the message by performing the following steps:
 - determining if it is able to satisfy the one or more conditions specified in the request message and if so, decrementing the token value within the message, and then
- 15 determining if the token value in the request message indicates that at least one further computer device is required to be located and if so, forwarding the message, or a plurality of daughter messages, on to a subsequent computer device or devices within the computer network unless a restriction criterion has been met.
- 20 2. A method as claimed in claim 1 wherein each message includes a number of further hops permissible as a restriction criterion and each time the message is newly received by a device it decrements the number of further hops permissible until it reaches zero whereupon the restriction criterion is deemed to have been met.
- 25 3. A method as claimed in either of the preceding claims, wherein each device maintains a probability associated with each neighbouring device and wherein these probabilities are used to determine to which neighbouring device or devices a message or messages is or are to be sent.
- 30 4. A method as claimed in claim 3 wherein a device periodically requests certain of its neighbours to re-register with other devices in dependence upon the probabilities associated with its neighbouring devices.

5. A method of storing a data file in a computer network, the method comprising the steps of:

identifying a predetermined number of computers within a computer network which satisfy one or more specified conditions by: a first computer which has a copy

5 of the data file to be stored communicating to one or more of the other computers in the network a request message which includes said one or more specified conditions and a token value which is indicative of a number of computer devices to be located by the message; each subsequent computer which receives a request message processing the message by performing the following steps: determining if it is able to
10 satisfy the one or more conditions specified in the request message and if so, reporting this fact back to the first computer and decrementing the token value within the message, and then determining if the token value in the request message indicates that at least one further computer device requires locating by the message and if so, forwarding the message, or a plurality of daughter messages, on to a
15 subsequent computer device or devices within the computer network unless a restriction criterion has been met;

generating a first plurality, corresponding to the identified predetermined number of computers, of erasure coded fragments from the data file such that any subset of the fragments which contains at least a smaller predetermined number of
20 the first plurality of fragments can be used to recreate the data file; and

transmitting each of the erasure coded fragments to a respective one of the identified computers for storage thereon; wherein at least one of the one or more specified conditions is that the computer has sufficient storage space available for storing one of said fragments.

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6. A method as claimed in claim 5 wherein the discovery step further includes the steps of any one or more of the steps set out in claims 2 to 4.

7. A method as claimed in claim 5 or 6 wherein each fragment is encoded

30 before transmission to a respective identified computer.

8. A method as claimed in claim 5, 6 or 7 wherein each fragment is transmitted together with the public key of a public/private key combination belonging to a user attempting to store the data file.

5 9. A method as claimed in claim 5, 6, 7 or 8 wherein the data file is first transmitted from a remote client device to a gateway computer which is on the other side of a firewall between the remote client device and the gateway server, the computer network within which the computers are to be identified also being located on the other side of the firewall to the remote client device.

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10. A computer network comprising a plurality of computer devices having data connections such that each computer device within the network can communicate with any other device within the network provided both computers are running and correctly connected into the network, each device within the network comprising:

15 a request generator for generating request messages each of which includes a token value indicative of the number of other devices within the network to be identified by the message and one or more specified conditions which each identified computer is to satisfy; and

 a request processor for processing received request messages by:

20 determining if it is able to satisfy the one or more conditions specified in the request message and if so, decrementing the token value within the message and identifying itself to the originator of the corresponding received request message, and then,

25 determining if the token value in the request message indicates that at least one further computer device requires locating by the message and if so, forwarding the message, or a plurality of daughter messages, on to a subsequent computer device or devices within the computer network unless a restriction criterion has been met.

30 11. A computer device for forming part of a computer network comprising a plurality of computer devices having data connections such that each computer device within the network can communicate with any other device within the

network provided both computers are running and correctly connected into the network, the device comprising:

a request generator for generating request messages each of which includes a token value indicative of the number of other devices within the network to be
5 identified by the message and one or more specified conditions which each identified computer is to satisfy; and

a request processor for processing received request messages by:
determining if it is able to satisfy the one or more conditions specified in the
request message and if so, decrementing the token value within the message and
10 identifying itself to the originator of the corresponding received request message, and
then,

determining if the token value in the request message indicates that at least
one further computer device requires locating by the message and if so, forwarding
the message, or a plurality of daughter messages, on to a subsequent computer
15 device or devices within the computer network unless a restriction criterion has been
met.